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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/692,584	10/24/2003	Mukerrem Cakmak	089498-0447	9481

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ROETZEL AND ANDRESS  
222 SOUTH MAIN STREET  
AKRON, OH 44308

EXAMINER
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LEE, RIP A

ART UNIT	PAPER NUMBER
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1713

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	03/22/2007	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/692,584	<b>Applicant(s)</b> CAKMAK ET AL.	
	<b>Examiner</b> Rip A. Lee	<b>Art Unit</b> 1713	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 21 December 2006.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 11-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 11-20 is/are rejected.
- 7) ☒ Claim(s) 12 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

### **DETAILED ACTION**

This office action follows a request for continued examination (RCE) under 37 § C.F.R. 1.114, filed on December 21, 2006. Claim 11 has been amended. Claims 11-20 remain pending.

#### ***Claim Objections***

1. Claim 12 remains objected to because of the following informalities: It is not clear what types of polymer, *i.e.*, chemical class or constitution is encompassed in the generic terms “amorphous polymers” and “crystallizing polymers.” The specification does not provide guidance for ascertaining the nature of said polymers. Appropriate correction is required.

#### ***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

4. Claims 11-14, 16, and 18-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kobayashi *et al.* (U.S. 6,139,948) in view of Okabe *et al.* (U.S. 4,725,472).

Example 1-4 of Kobayashi *et al.* teaches a process comprising the steps of blending polylactic acid and 0.5 parts by weight of silica (average particle size of 7-50 nm; col. 5, line 42) and extruding the melt mix from a single screw extruder at 150-200 °C. The product was cooled on a casting roll at 30 °C to obtain unstretched film having an average thickness of 400 µm. In a subsequent step, the unstretched film was stretched in the machine direction with a hot roll at 60 °C and stretched in the transverse direction in a tenter at 70 °C. The resulting biaxially stretched film had a thickness of 0.1 µm. The reference does not indicate specifically that the product is quenched to yield an amorphous polymer, as recited in the instant claims.

Okabe *et al.* discloses a conventional process for making biaxially stretched polyester film. The steps involve extruding a melt mix of polyester and inert filler and quenching the molten extrudate on a casting drum to obtain a sheet or film. Biaxial drawing may be carried out in a known manner by sequential multi-stage procedure or a simultaneous single stage procedure (col. 4, lines 15-25).

It would have been obvious to one having ordinary skill in the art, based on evidence furnished in Okabe *et al.*, that the process step in Kobayashi *et al.*, in which film is cooled on a casting roll at 30 °C, is a quenching step. This notion is especially obvious in view of the fact that Kobayashi *et al.* does not provide any indication that this step is not unexceptional. Even if one having ordinary skill in the art lacked sufficient guidance, he would merely turn to Okabe *et al.* which teaches a conventional process for making polyester film. One of ordinary skill in the art would have found it obvious to quench the extrudate on a casting roll in order to obtain film quickly for the subsequent stretching process. Since this is a well-known process, one having ordinary skill in the art would have expected the combination of teachings to work with a reasonable expectation of success.

Kobayashi *et al.* is silent regarding to the amorphous nature of the quenched extrudate, however, it would have been obvious to one having ordinary skill in the art that the rapidly quenched melt, which has not been subjected to crystallization inducing cooling, would exhibit amorphous characteristics, especially in light of the fact that the polyester is aliphatic in nature.

Kobayashi *et al.* is also silent regarding the strain hardening phenomenon, however, in light of the fact the process described in the prior art is essentially the same as that recited in the instant claims, and in view of the fact that Kobayashi *et al.* teaches biaxial stretching of the product in order to obtain a film with excellent mechanical strength and durability, it would have been obvious to one having ordinary skill in the art that polyester film undergoes the claimed strain hardening.<sup>†</sup>

Since the PTO can not perform experiments, the burden is shifted to the Applicants to establish an unobviousness difference regarding the amorphous character of the polymer in Kobayashi *et al.* after quenching and regarding the presence of strain hardening in the stretched polymer. *In re Best*, 562 F.2d 1252, 1255, 195 USPQ 430, 433 (CCPA 1977). *In re Spada*, 911 F.2d 705, 709, 15 USPQ2d 1655, 1658 (Fed. Cir. 1990).

5. Claims 11-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Qian *et al.* (U.S. 6,407,155) in view of Haruta *et al.* (U.S. 3,773,609) or Ishibashi *et al.* (U.S. 5,180,626).

Qian *et al.* relates to methods for making nanocomposite materials by forming a mixture of polymer matrix and nanoparticulate filler in the amount of 0.05-60 wt % and melt blending said mixture. Although the amount of nanoparticulate filler is not expressed in terms of a volume percentage, it would have been obvious to one of ordinary skill in the art to believe that the 0.05-60 wt % range encompasses the recited ranges of 0.01-10 vol %, 0.1-10 vol %, and 1-10 vol % ranges set forth in the present claims, especially in light of the fact that the range disclosed in the patent spans two orders of magnitude. Nanocomposites of the invention are used in fabrication of films (col. 20, line 64), and Qian *et al.* contemplates use of biaxial stretching of the film to increase dimensional stability (col. 21, lines 16-31). The prior art does not disclose the process of biaxial stretching of films.

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<sup>†</sup>According to the current specification, it is the addition of nanoparticles that imparts novel strain-hardening characteristics to cast films (page 4, line 26). Stretching (uniaxially or multi-axially) of films so that the polymer chains become oriented in the stretch direction leads to strain hardening (page 6, lines 21-24).

Haruta *et al.* and Ishibashi *et al.* disclose conventional processes for making biaxially stretched polypropylene film. The steps involve melt blending resin and additives and extruding the melt at 240-280 °C. The extrudate is quenched on a cooling roll at 30-40 °C. In a subsequent step, the material is preheated at 155 °C and stretched simultaneously in the machine and transverse directions to provide a biaxially stretched film (Haruta *et al.*, example 2, lines 48-63 and Ishibashi *et al.*, example 1, col. 8, lines 43-55).

It would have been obvious to one having ordinary skill in the art to use the teaching in Haruta *et al.* and Ishibashi *et al.* in order to make biaxially stretched films from the composition of Qian *et al.* The combination is obvious because Qian *et al.* contemplates such an end use, and the secondary references furnish an otherwise obvious missing process step. Since biaxial stretching of polypropylene film is well-established in the art, one having ordinary skill in the art would have expected the combination of teachings to work with a reasonable expectation of success.

The references are silent regarding to the amorphous nature of the quenched extrudate, however, it would have been obvious to one having ordinary skill in the art that the rapidly quenched melt, which has not been subjected to crystallization inducing cooling, would exhibit amorphous characteristics, especially in light of the fact that the polyester is aliphatic in nature.

The references are also silent regarding the strain hardening phenomenon, however, in light of the fact the process described in the prior art is essentially the same as that recited in the instant claims, and in view of the fact that Qian *et al.* teaches biaxial stretching of the product in order to obtain a film with excellent mechanical strength and durability, it would have been obvious to one having ordinary skill in the art that polypropylene film undergoes the claimed strain hardening.<sup>†</sup>

Since the PTO can not perform experiments, the burden is shifted to the Applicants to establish an unobviousness difference regarding the amorphous character of the polymer of Qian *et al.* after quenching and regarding the presence of strain hardening in the stretched polymer. *In re Best*, 562 F.2d 1252, 1255, 195 USPQ 430, 433 (CCPA 1977). *In re Spada*, 911 F.2d 705, 709, 15 USPQ2d 1655, 1658 (Fed. Cir. 1990).

***Response to Arguments***

6. Applicants traverse the objection of claim 12. It is not the definition of the terms that is unclear, but rather the scope of polymer encompassed by these terms as pertains to the instant invention. The terms encompass an indefinite range of materials. That Applicant may find  $178,000 + 9,420 = 187,420$  "hits" corroborates this notion. The claim objection has not been withdrawn.

7. The rejections of claims over Kobayashi *et al.* alone and Deguchi *et al.* (U.S. 5,248,720) have been withdrawn in view of current amendments to claims.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rip A. Lee whose telephone number is (571)272-1104. The examiner can be reached on Monday through Friday from 9:00 AM - 5:00 PM. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Wu, can be reached at (571)272-1114. The fax phone number for the organization where this application or proceeding is assigned is (571)273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on the access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll free).



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March 19, 2007